

TROUBLESHOOTING WINDOWS XP

After reading this chapter and completing the exercises, you will be able to:

- ◆ Collect documentation about your systems to aid in troubleshooting and preventing problems
- ◆ Review common-sense approaches to troubleshooting
- ◆ Troubleshoot general problems with Windows XP Professional
- ◆ Use some of the troubleshooting tools found in Windows XP Professional

Troubleshooting Windows XP Professional, as with any operating system, is an important and vast subject area. In this chapter, you learn how to detect, isolate, and eliminate problems with installation, printing, remote access, networking, disks, and other aspects of a Windows XP Professional system.

In addition to the techniques discussed in this chapter, important troubleshooting options and features of Windows XP Professional have already been covered in previous chapters. The Registry is a common location for problems as well as a source for implementing solutions. The Registry is discussed in Chapter 12 “Working with the Windows XP Registry.” The Windows boot process can sometimes be prey to problems. These problems and related solutions are covered in Chapter 13, “Booting Windows XP.” Catastrophic events, virus infections, or simple hardware failure can leave you without a functioning system. Fault tolerance, system recovery, and working with backups are discussed in Chapter 14, “Windows XP Professional Fault Tolerance.” Keep in mind the troubleshooting advice provided in previous chapters as you attempt to prevent and resolve problems involving Windows XP Professional.

GENERAL PRINCIPLES OF TROUBLESHOOTING

When troubles arise in Windows XP Professional, you must take action to resolve the issues at hand as quickly as possible. Troubleshooting is the art and science of systematically diagnosing and eliminating problems in a computer system. Although troubleshooting may sound exciting, in reality it is usually a fairly tedious process. In the following sections, we present some procedures and common-sense guidelines that should improve your troubleshooting skills and help you keep downtime to a minimum.

Collect Information

The first rule of troubleshooting is: You can never have too much information. In fact, information is your best weapon not just for resolving problems, but also for preventing them in the first place. Useful, detailed information typically falls into three areas: your system (hardware and software), previous troubleshooting, maintenance, and configuration activities, and the current problem.

Collecting information about your system's hardware and software is preventive maintenance. All pertinent information, kept in an accessible form and location, is called a **Computer Information File (CIF)**. A good CIF provides detailed information about the hardware and software products that comprise your computer (and even your entire network). A CIF is not just a single file, but an ever-expanding accumulation of data sheets sorted into related groupings. Your CIF should be stored in a protected area (such as a safe or fireproof vault) that can be accessed in the event of an emergency (a bank's safety deposit box won't allow you to get at the information at 3:00 in the morning). Obviously, constructing a CIF from scratch is a lengthy process, but one that will be rewarded with problems solved, easy reconfigurations, or simplified replacement of failed components.

Here are some of the important elements you'll want to include in your CIF:

- Platform, type, brand, and model number of each component
- Complete manufacturer specifications
- Configuration settings, including jumpers and dip switches, as well as what each setting means, including IRQs, DMA addresses, memory base addresses, port assignments, and so forth
- The manual, user's guide, or configuration sheets
- Version of BIOS, driver software, patches, fixes, etc., with floppy copies
- Printed and floppy copies of all parameter and initialization files
- Detailed directory structure printout
- Names and versions for all installed software
- Network-assigned names, locations, and addresses

- Status of empty ports or slots, upgrade options, or expansion capabilities
- System requirements, such as the manufacturer's listed minimum system requirements for its operating system, driver, application, hardware, etc.
- Warranty information, such as service phone numbers and e-mail addresses, and support Web sites
- Complete technical support contact information
- Error log with detailed and dated entries of problems and solutions
- Date and location of the last complete backup
- Location of backup items and original software
- Network layout and cabling map
- Copies of all software, operating system, and driver installation or source CDs and/or floppies

Each of these items should be dated and initialed. However, your CIF is not complete if it contains only hardware and software details. You should also include the nonphysical characteristics of your system, such as:

- Information services present, such as Web, FTP, e-mail, newsgroups, message boards, etc.
- Important applications, such as productivity suites (Microsoft Office), collaboration utilities, white board applications, video conferencing, etc.
- Plans for future service deployments
- A mapping or listing of related hardware and software with each service or application present on the system
- Structure of authorized access and security measures
- Training schedule
- Maintenance schedule
- Backup schedule
- Contact information for all system administrators
- Personnel organization or management hierarchy
- Workgroup arrangements
- Online data storage locations
- In-house content and delivery conventions
- Authorship rights and restrictions
- Troubleshooting procedures

Neither of these lists is exhaustive. As you operate and maintain your systems, you'll discover numerous other important items to add to the CIF. Don't be bashful about customizing these lists to meet your particular needs and circumstances—if it doesn't work for you, it doesn't work at all. Period.



Remember, if you don't document it, then you won't be able to find it when you really need it. A good way to keep any CIF current is to add to, remove, or modify its contents each time you make a system modification. Performing a quarterly or semi-annual audit of each CIF is not a bad idea, either.

It is essential that the contents of the CIF be complete and up-to-date. Without thorough, specific, and accurate information about the products, configuration, setup, and problems associated with your network, the CIF will be all but useless. Keep in mind that the time you spend organizing your CIF will reduce the time required to locate information when you really need it. It is wise to create a correlation system so you can easily associate items in the CIF with the actual component, such as an alphanumeric labeling system. For instructions on how to create a CIF, see Hands-on Project 15-2.

We recommend maintaining both a printed/written version and an electronic version of this material. Every time a change, update, or correction occurs, it should be documented in the electronic version, and a printout made and stored. Murphy's Law guarantees that the moment you need your electronic data most, your system will not function.

Use Common-Sense Troubleshooting Guidelines

When problems occur, you would like to be at your sharpest. However, as a corollary to Murphy's Law, you'll probably find that problems tend to occur when you are stressed, short on time, or when it is just generally inconvenient. If you take the time now to keep your CIF up-to-date and heed the following common-sense guidelines, you'll take some of the headache out of troubleshooting, and you'll be better prepared to resolve problems quickly. Although common sense is sometimes in short supply, it is a key ingredient for successful troubleshooting.

- *Be patient*—Anger, frustration, hostility, and frantic impatience usually cause problems to intensify rather than dissipate.
- *Be familiar with your system's hardware and software*—If you don't know what the normal baselines for your system are, you may not know when a problem is solved or when new problems surface. (See Chapter 10, "Performance Tuning" for information on creating baselines.)
- *Attempt to isolate the problem*—When possible, eliminate segments or components that are functioning properly, thus narrowing the range of suspected sources for a problem or failure.
- *Divide and conquer*—Disconnect, one at a time, as many nonessential devices as possible to narrow the scope of your investigation.

- *Eliminate suspects*—Move suspect components, such as printers, monitors, mice, or keyboards, to a known working computer to see if they work in their new location. If they work, they're not at fault; if they don't, they may very well be involved in the problem you're trying to solve.
- *Undo the most recent change*—If you have recently made a change to your system, the simplest fix may be to back out of the most recent alteration, upgrade, or change made to your system.
- *Investigate common points of failure first*—The most active or sensitive components also represent the most common points of failure—including hard drives, cables, and connectors.
- *Recheck items that have caused problems before*—As the old axiom goes, history does repeat itself (and usually right in your own backyard).
- *Try the easy and quick fix first*—Try the easy fixes before moving on to the more time-consuming, difficult, or even possibly destructive measures.
- *Let the fault guide you*—The adage “Where there is smoke, there is fire” applies not only to the outside world, but to computer problems as well. Investigate components and system areas associated with the suspected fault.
- *Makes changes one at a time*—A long flight of stairs is best traversed one step at a time; attempting to leap several or all of the steps may result in injury or death. When troubleshooting, a step-by-step process enables you to identify the solution clearly when you stumble upon it.
- *Repeat the failure*—Often repeating an error is the only way to identify it. Transient and inconsistent faults are difficult to diagnose until you see a pattern in their occurrence.
- *Keep a detailed log of errors and attempted solutions*—Keep track of everything you do (both successful and failed attempts). This will prove an invaluable resource when an error recurs on the same or a different system, or when the same system experiences a related problem.
- *Learn from mistakes (your own and others')*—Studying the mistakes of others can save you from repeating them; a wise person uses failures to find a better solution.
- *Experiment*—If your diagnosis is inconclusive, try similar tasks to the ones that provoke the problem to see if a pattern develops.

There is probably not much in this list of common sense items that you don't already know. The hardest part is remembering these in the heat of a crisis.

TROUBLESHOOTING TOOLS

Becoming familiar with the repair and troubleshooting tools native to Windows XP Professional can save you countless hours when troubleshooting. In the next sections, we detail the use of the Event Viewer and the Computer Management tools.

Event Viewer

The **Event Viewer** is used to view system messages regarding the failure and/or success of various key occurrences within the Windows XP Professional environment (see Figure 15-1). The items recorded in the Event Viewer's logs inform you of system drivers or service failures as well as security problems or misbehaving applications (see Hands-on Project 15-1).

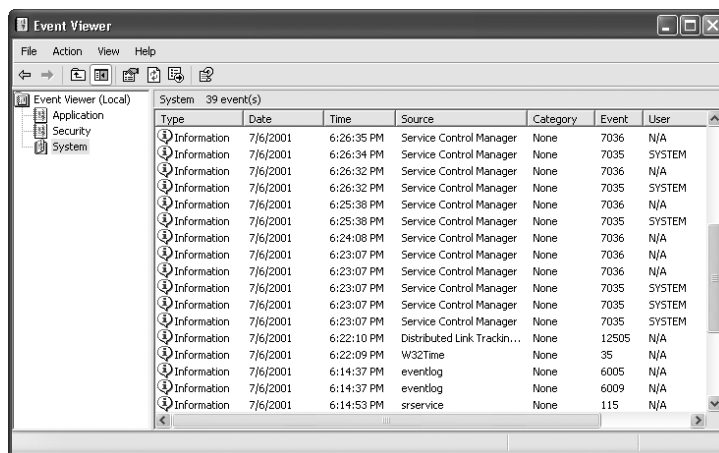


Figure 15-1 Event Viewer with System log selected

Located in the Administrative Tools section of the Control Panel, the Event Viewer is used to view the logs that Windows XP Professional creates automatically:

- **System log**—Records information and alerts about Windows XP Professional's internal processes, including hardware and operating system errors, warnings, and general information messages.
- **Security log**—Records security-related events, including audit events for failed logons, user rights alterations, and attempted object accesses without sufficient permissions.
- **Application log**—Records application events, alerts, and some system messages.
- **Directory Service**—Records events related to the Directory Service.
- **DNS Service**—Records events related to the DNS Service.
- **File Replication Service**—Records events related to the File Replication Service.

Each log records a different type of event, but all the logs collect the same meta-information about each event: date, time, source, category, event, user ID, and computer. Each logged event includes some level of detail about the error, from an error code number to a detailed description with a memory HEX buffer capture. For example, Figure 15-2 shows the properties of a logged event related to the workstation's attempt to register a DNS address, or an A record, with an unreachable directory server. Most system errors, including stop errors that result in the blue screen, are recorded in the System log, allowing you to review the time and circumstances of a system failure. The details in the Event Viewer can often be used as clues in your search for the actual cause of a problem. However, most event log details offer little information on resolving the problems they document.

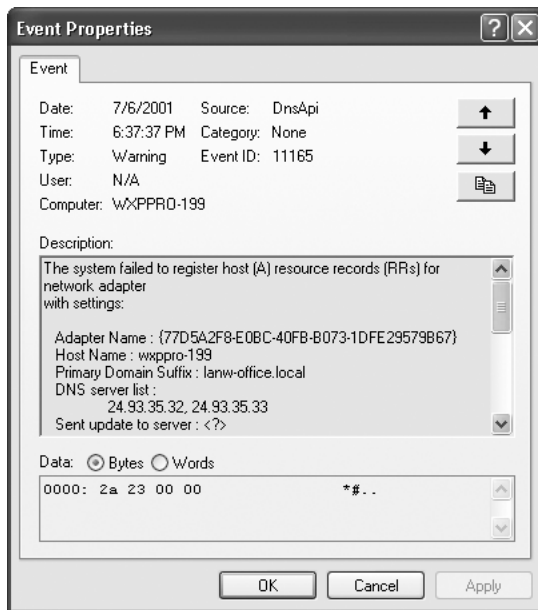


Figure 15-2 Event Viewer's Event Properties windows displays logged event details

Computer Management Tool

Windows XP Professional builds on the robustness of Windows 2000, and on the convenience of its Plug and Play assisted configuration capabilities. In Windows XP, these same capabilities provide easy access to troubleshooting tools for nearly every aspect of the operating system. A large number of these tools are collected into a single interface called the Computer Management tool (see Figure 15-3), found in the Performance and Maintenance Tools display in the Administrative Tools application within the Control Panel.

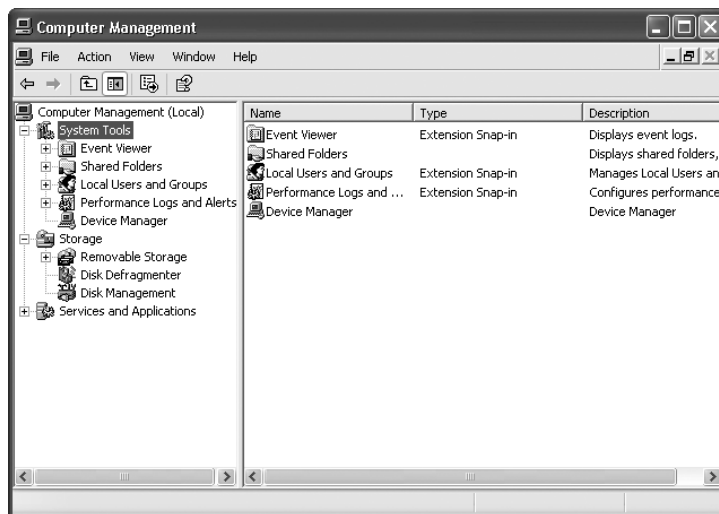


Figure 15-3 The Computer Management tool makes most management tools available through a single management console

The Computer Management tool includes many tools identical to those in Windows 2000; there are some new entries, but some entries have been dropped (system information and logical drives are the most noteworthy in this group). Grouping these utilities in a single interface makes locating and resolving problems on key system components easier than ever before (see Hands-on Project 15-3). The Computer Management console is divided into three sections: System Tools, Storage, and Services and Applications. The System Tools section contains five individual tools:

- *Event Viewer*—Used to view system messages regarding the failure and/or success of various key occurrences within the Windows XP Professional environment. Details of system errors, security issues, and application activities are recorded in the logs viewed through the Event Viewer. See the description of the Event Viewer earlier in this chapter. Hands-on Project 15-1 shows you how to use the Event Viewer.
- *Shared Folders*—Used to view shared folders defined on the local system. This interface shows hidden and public shares, current sessions, and open files, and also allows you to view and alter the share configuration settings for user limits, caching, and permissions.
- *Local Users and Groups*—Used to create and manage local user accounts and groups. (This tool is disabled when the Active Directory is present.) Details on use, examples, and hands-on projects for this tool are included in Chapter 5, “Users, Groups, Profiles, and Policies.”
- *Performance Logs and Alerts*—Another means to access the Performance monitoring tool of Windows 2000 (the use of this tool in troubleshooting is rather tedious and complex; see Chapter 11, “Windows XP Professional Application Support,” for examples and hands-on projects involving this tool).

- *Device Manager*—Used to view and alter current hardware configurations of all existing devices. Details on how to use, examples, and hands-on projects for this tool appear in Chapter 3, “Using the System Utilities.”

The Storage section of Computer Management presents three tools for administering storage devices. Details on use, examples, and hands-on projects appear in Chapter 4, “Managing Windows XP File Systems and Storage.”

- *Removable Storage*—Manages removable media such as floppy disks, tapes, and Zip drives.
- *Disk Defragmenter*—Improves the layout of stored data on drives by reassembling fragmented files and aggregating unused space.
- *Disk Management*—Views and alters the partitioning and volume configuration of hard drives.

The Services and Applications section contains management controls for various installed and active services and applications. Though the actual contents of this section depend on what is installed on your system, some common controls include:

- *Services*—Stops and starts services and configures the startup parameters for services (such as whether to launch when the system starts and whether to employ a user account security context to launch the service). Hands-on Project 15-8 shows you one way to use this tool.
- *WMI Control*—Configures and controls the Windows Management Instrumentation service, a service designed for Web-based or network access. This tool allows network management systems (or related software) to interact with agent software on a Windows XP Professional machine to install, set up, or update system or application software and related configuration data.
- *Indexing Service*—Defines the corpus (collection of documents indexed for searching) for the Indexing Service. For information on using this tool, consult the *Microsoft Windows 2000 Server Resource Kit*.

Troubleshooting Wizards and Widgets

Continuing the trend established in Windows 2000, Windows XP Professional includes a great many troubleshooting Wizards associated with specific system components or services. For example, the Settings tab in the Display Properties applet (most easily accessed by right-clicking any unoccupied spot on the desktop, then selecting the Properties entry in the resulting pop-up menu) includes a Troubleshoot button, as shown in Figure 15-4. Clicking that button brings up the Video Display Troubleshooter depicted in Figure 15-5; selecting any of its entries leads you through a series of questions with answers and explanations that deal very effectively with common sources of trouble. Similar buttons for other system controls, including Phone and Modem Options (which also has a troubleshooting button), or the Local Area Connection Properties, might be labeled “Repair” instead, but they offer similar kinds of guided troubleshooting support.

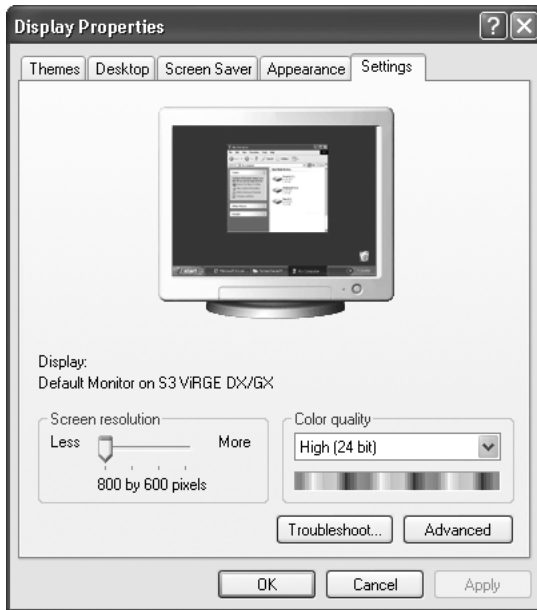


Figure 15-4 Settings tab in the Display Properties applet

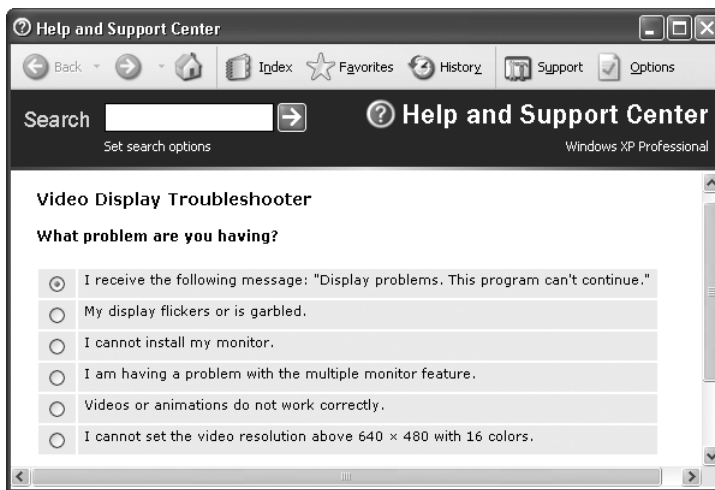


Figure 15-5 The Video Display Troubleshooter

As you investigate the management utilities or Control Panel applets for the system aspects or components you're troubleshooting, don't overlook the kinds of help that the system itself can provide. One of the biggest changes from Windows 2000 to Windows XP Professional is the adoption of a task-oriented metaphor to provide help and guidance, where troubleshooting tasks figure prominently in the lists of tasks for which help and support are available.

TROUBLESHOOTING INSTALLATION PROBLEMS

Unfortunately, the installation process for Windows XP Professional is susceptible to several types of errors: media errors, domain controller communication difficulties, Stop message errors or being hung up on a blue screen, hardware problems, and dependency failures. The following list contains a short synopsis of each error type and possible solutions:

- *Media errors*—Media errors are problems with the distribution CD-ROM itself, the copy of the distribution files on a network drive, or the communication link between the installation and the distribution files. The only regularly successful solution to media errors is to switch media: copying the files to a network drive, linking to a server's CD-ROM, or installing a CD-ROM on the workstation. If media errors are encountered, always restart the installation process from the beginning.
- *Domain controller communication difficulties*—Communication with the domain controller is crucial to some installations, especially when attempting to join a domain. Most often this problem is related to mistyping a name, password, domain name, etc., but network failures and offline domain controllers also can be involved. Verify the availability of the domain controller directly and from other workstations (if warranted), and then check that no entries were mistyped during the installation process.
- *Stop message errors or halting on the blue screen*—Using an incompatible or damaged driver is the most common cause of Stop messages and halting on the blue screen during installation. If any error information is presented to you, try to verify that the proper driver is in use. Otherwise, double-check that your hardware has the drivers necessary to operate under Windows XP Professional.
- *Hardware problems*—If you failed to verify your hardware with the HCL (hardware compatibility list), or a physical defect has occurred in a previously operational device, strange errors can surface. In such cases, replacing the device in question is often the only solution. Before you go to that expense, however, double-check the installation and configuration of all devices within the computer. Sometimes, manual resolution of conflicts that Plug and Play is unable to resolve automatically can cure hardware problems.
- *Dependency failures*—The failure of a service or driver owing to the failure of a foundation class, or of some other related service or driver, is called a dependency failure. An example is the failure of Server and Workstation services because the NIC fails to initialize properly (see Hands-on Project 15-8). Often Windows XP Professional will boot despite such errors, so check the Event Viewer (see Hands-on Project 15-1) for more details (see Figure 15-6 for an example of a warning reported because a common service proves to be unavailable). Most dependency errors usually appear immediately after OS or new software installation, or alteration in system configuration.

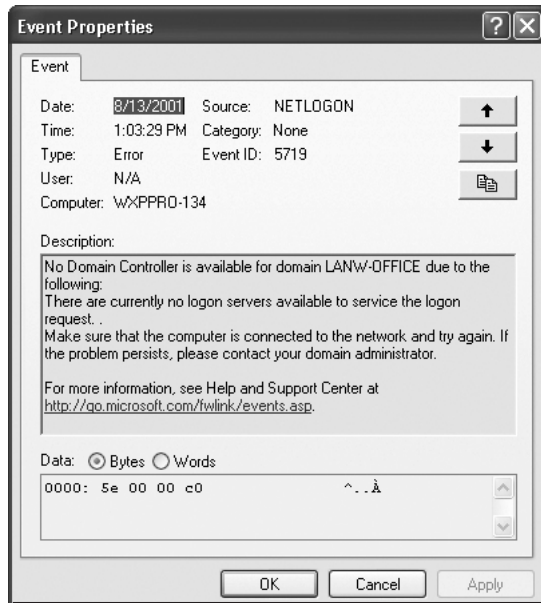


Figure 15-6 Event Properties dialog box

Just knowing about these installation problems can help you avoid them. However, successfully installing Windows XP Professional does not eliminate the possibility of further complications. Fortunately, Microsoft has included several troubleshooting tools that can help locate and eliminate most system failures (see the “Troubleshooting Tools” section earlier in this chapter).

TROUBLESHOOTING PRINTER PROBLEMS

Problems with network printers can often bring normal activity to a halt. They can occur anywhere between the printer’s power cable and the application that’s attempting to print. Systematic elimination of possible points of failure is the only reliable method for eliminating such errors. Here are some useful tips for troubleshooting common printer problems:

- Always check that the physical components of the printer—cable, power, paper, toner, and so on—are present, properly loaded, or connected, as appropriate.
- Make sure the printer is online. There is typically a light or an LCD message to indicate this. You may need to press the Reset button or an Online button to set or cycle the printer into online mode.
- Make sure the printer server for the printer is booted.

- Verify that the logical printer on both the client and server sides exist, and check their configuration parameters and settings. For details on logical printers and their multitudes of controls, see Chapter 9, “Printing and Faxing.”
- Check the print queue for stalled jobs (see Figure 15-7, which shows a printing print job). Note: if a print job does not show an explicit status (such as waiting, paused, printing, etc.) you can assume it is stalled. The print queue is accessed by clicking the Start menu, selecting Printers and Faxes, selecting the printer whose queue you wish to examine, then clicking the “See what’s printing” entry in the Printer Tasks list.

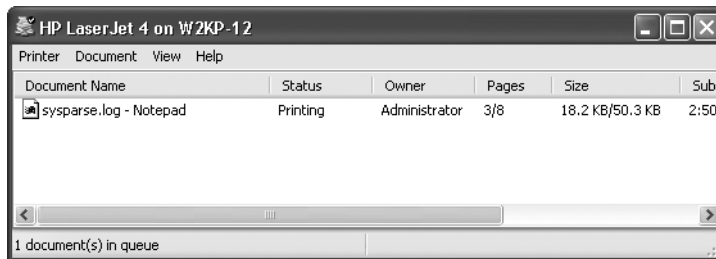


Figure 15-7 The default window for any printer shows the contents of its print queue

- Reinstall or update the printer driver in case it’s corrupt or incorrect.
- Attempt to print from a different application or a different client.
- Attempt to print using Administrator access.
- Stop and restart the spooler using the Services tool found through Computer Management (try Hands-on Project 15-4).
- Check the status and CPU usage of the spoolsv.exe process using the Task Manager (see Figure 15-8). If the spooler seems to be stalled—it will either be obtaining no CPU time at all or consuming most of the CPU—you should stop and restart the spooler service.
- Check the free space on the drive where the print spool file resides, and change its destination if less than 100 MB of free space is available. The amount of free space that a spooler file needs is a function of the size and number of print jobs and the logical printer’s settings, but in most cases, 100 MB is sufficient. You should change the spool file host drive if there is insufficient space or you suspect the drive is not fast enough. Make this change on the Advanced tab of the Server Properties dialog box accessed from the File menu in the Printer Folder. See Chapter 9 for more information.

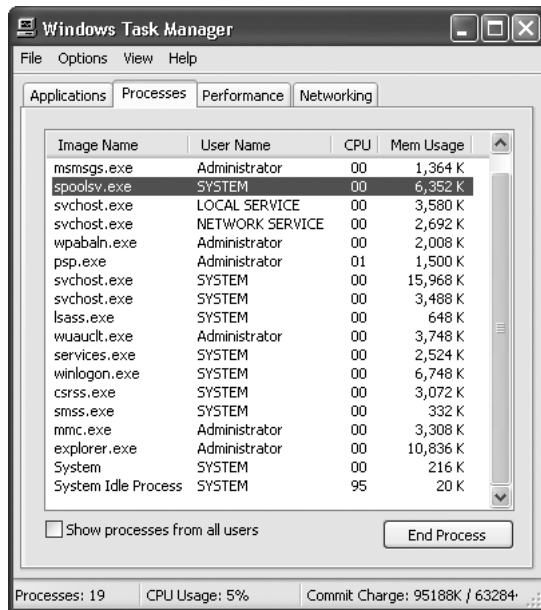


Figure 15-8 The Windows Task Manager, Processes tab

Table 15-1 Printer Troubleshooting

Network Printing Problem	Solutions
<p>Pages print, but only a single character appears on each page. --or--</p> <p>Pages print but they include control codes. --or--</p> <p>Pages print, but they show random characters instead of the desired document.</p>	<ol style="list-style-type: none"> 1. If the job has not completed printing, delete it from the print queue to prevent wasting more paper. 2. Remove and reinstall the logical printer and/or the printer driver on the client (if only a single workstation experiences the problem) or on the server (if all workstations experience the problem). 3. Verify that the data type set in the logical printer is correct for the application used, printer driver installed, and capabilities of the physical print device. 4. Stop and restart the spooler service.
<p>An access denied or no access available message is displayed when a print job is submitted.</p>	<p>This is typically caused by improper permissions defined on the printer share. Double-check the permission settings. You may also need to review the group memberships of the affected users if you are employing any Deny permissions on the printer share.</p>
<p>A network attached printer shows an error light on the network interface.</p>	<p>A network communication or identification error has occurred. Cycling the power on the printer may resolve the problem. If not, try disconnecting then reconnecting the network media while the printer is powered off.</p>

Table 15-1b Printer Troubleshooting (continued)

Network Printing Problem	Solutions
No documents are being created by the physical print device, but the print queue shows that the job is printing.	<ol style="list-style-type: none"> 1. View the print queue to see if a print job is stalled or paused. If so, delete or resume the print job. 2. If no other print job is present, delete the current print job and resubmit it from the original application. 3. Stop and restart the spooler service.
The printer share is not visible from a client (i.e., does not appear in Network Neighborhood or My Network Places).	<ol style="list-style-type: none"> 1. The client system may not be properly connected to the network. Shut down the client, check all physical network connections, reboot. Test whether you can access any other network resources. 2. Check the installed protocol and its settings, especially if TCP/IP is being used. 3. Check the domain/workgroup membership of the client.
On larger print jobs, pages from the end of the print job are missing from the printed document.	This can occur when insufficient space is available on the drive hosting the spooler file. Either free up space on the host drive or move the spooler file to a drive with more available space.

For a starter step-by-step on printer troubleshooting, try Hands-on Project 15-4. This list covers most common print-related problems. For more tips on troubleshooting, consult the *Microsoft Windows XP Professional Resource Kit*.

TROUBLESHOOTING RAS PROBLEMS

Remote Access Service (RAS) is another area with numerous points of possible failure—from the configuration of the computers on both ends, to the modem settings, to the condition of the communications line. Unfortunately, there is no ultimate RAS troubleshooting guide, but here are some solid steps in the right direction:

- Check all physical connections.
- Check the communication line itself, with a phone if appropriate.
- Verify the RAS configuration and the modem setup by attempting to establish a connection to another server or by deleting and recreating the connection object. For detailed examples and hands-on projects, see Chapter 8, “Internetworking with Remote Access.”
- Check that both the client and the server dialup configurations match, including speed, protocol, and security. See Figure 15-9 for an example of the security settings for a dialup connection. You’ll need to view the other tabs to compare and confirm speed, protocol, and other connection settings.

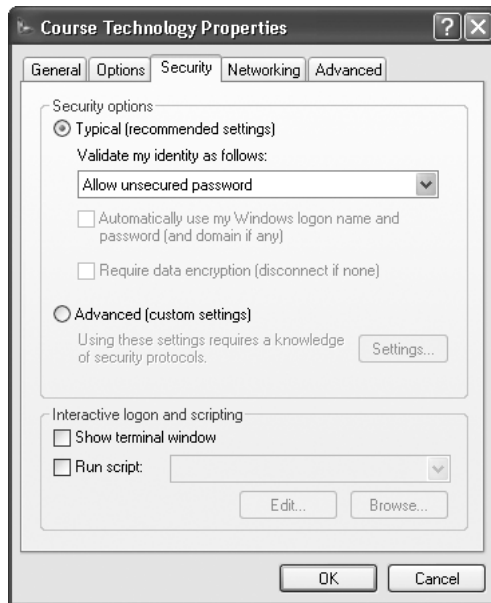


Figure 15-9 Setting Security options

- Verify that the user account has RAS privileges.
- Inspect the RAS-related logs: Device.log and Modemlog.txt. Look for errors involving failure to connect, failure to dial, failure to authenticate, failure to negotiate encryption, failure to establish a common protocol, and link termination.
- Remember that Multilink and callback do not work together; you must select one or the other. Because nobody has developed technology to perform multi-line callbacks, only single-line callbacks are possible. Figure 15-10 shows a configuration setting on a connection object that allows the caller to define a specific callback number to complete a dial-up connection (to access the window shown, select Start|Control Panel|Network Connections, then select the connection, then select the Dial-up Preferences entry in the Advanced menu at the top of the Network Connections window).
- Autodial and persistent connections may cause a computer to attempt RAS connection with each logon; in some cases, you may need to disable such settings to permit easier troubleshooting of connection problems.



Most RAS problems are related to misconfiguration. For more details on RAS, refer to Chapter 8 or the *Microsoft Windows XP Professional Resource Kit*.

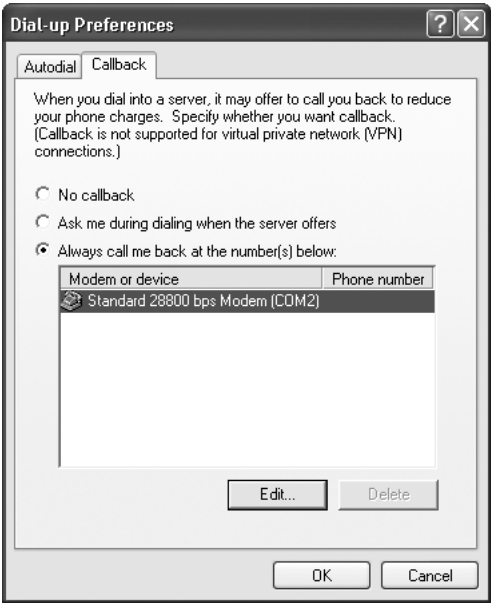


Figure 15-10 Dial-up Preferences, Callback tab

Table 15-2 RAS Troubleshooting

Network Printing Problem	Solutions
The connection object fails to establish a network link with the remote server.	<div><div>1. Check the username, password, and phone number.</div><div>2. Verify that the modem device is powered on and properly connected to the computer and the phone line. You should also check the installed driver and update it if necessary.</div><div>3. Verify that the security settings match those required by the remote server.</div><div>4. Verify that the protocol settings match those required by the remote server.</div></div>
The client has multilink enabled and has three identical modems for the connection, but only one modem establishes a network link with the remote server.	<div><div>1. Verify that the remote server supports multilink and that it has multilink connections enabled.</div><div>2. Verify that you need to dial the same or different phone numbers when establishing a multilink connection.</div><div>3. Cycle the power on the modems. Verify that they are properly attached to the computer and the telephone line.</div></div>

Table 15-2 RAS Troubleshooting (continued)

Network Printing Problem	Solutions
A network link is broken during a remote session after a successful link is established.	<ol style="list-style-type: none"> 1. Your phone line probably has call waiting and another call came in. Disable call waiting through the connection object. 2. If your telephone line quality is poor (old wiring, phone lines pass by electrical interference, or the weather is bad), connection interruptions are common. You may need to upgrade your internal wiring, request a service upgrade from the telephone company, reroute wiring to avoid interference, or wait until the weather clears. 3. Remote systems can disconnect you for a variety of reasons, most beyond your control and knowledge. In most cases, simply try to re-establish the connection.

TROUBLESHOOTING NETWORK PROBLEMS

Network problems range from faults in the network cables or hardware, to misconfigured protocols, to workstation or server errors. As with all troubleshooting, attempt to eliminate the obvious and easy (such as physical connections and permissions) before moving on to more drastic, complex, or unreliable measures (such as IP configuration, routing, and domain structure). Cabling, connections, and hardware devices are just as suspect as the software components of networking. Verifying hardware functionality involves more than just looking at it; you may need to perform some electrical tests, change physical settings, or even update drivers or ROM BIOS settings.

Common-sense first steps include the following:

- Check to see if other clients or servers or subnets are experiencing the same problem.
- Check physical network connections, including the NIC, media cables, terminators, and logically proximate network devices (such as hubs, repeaters, routers, etc.).
- Check protocol settings.
- Reboot the system.
- Verify that the NIC drivers are properly installed. Use the self-test or diagnostic tools or software for the NIC if available.
- Verify the domain/workgroup membership of the client.

Table 15-3 Network Connection Troubleshooting

Connectivity Problem	Solutions
<p>The client does not seem to connect to the network (i.e., no objects are visible in the Network Neighborhood).</p> <p>--or--</p> <p>The client is unable to authenticate with the domain.</p>	<ol style="list-style-type: none"> 1. Use the Event Viewer to look for errors in the System log. Resolve any issues discovered. 2. Check the physical network connections, including the NIC, media, and local network devices. 3. Check the NIC driver; update or replace if necessary. 4. Check the installed protocol and its configuration settings. 5. Check the domain/workgroup membership. 6. Reboot the client.
A system disconnects from the network randomly or when other computers boot onto the network.	<ol style="list-style-type: none"> 1. Check to see that you are not violating the length, segments, or nodes-per-segment limitations on the network media in use. 2. Verify that all systems have unique address assignments and system computer names. 3. Check for breaks in the network media or the proximity of electrical or magnetic interference.
Shared network resources, such as folders and printers, cannot be accessed from a client.	<ol style="list-style-type: none"> 1. Check the assigned permissions on the share itself and on the object (if applicable). 2. Check group memberships for Deny permissions. 3. Attempt to access the resources using a different user account or client. 4. Check that the computer is connecting to the network.

TROUBLESHOOTING DISK PROBLEMS

The hard drive is the component on your computer that experiences the most activity, even more than your keyboard or mouse. It should not be surprising that drive failures are common. Windows XP Professional maintains and tunes its file system automatically (see Chapter 4), but even a well-tuned system is subject to hardware glitches. Most partition, boot sector, and drive configuration faults can be corrected or recovered using the Disk Management tool in the Computer Management utility in Administrative Tools (for detailed information on using this tool and on troubleshooting disk problems, see Chapter 4). However, the only reliable means of protecting data on storage devices is to maintain an accurate and timely backup, as discussed in Chapter 14, “Windows XP Fault Tolerance.”

MISCELLANEOUS TROUBLESHOOTING ISSUES

The following is a “grab bag” of troubleshooting tips that don’t fit into the other categories described in this chapter.

Permissions Problems

Permissions problems (problems with accessing or managing system resources like folders, files, or printers) usually occur when a user is a member of groups with conflicting permissions or when permissions are managed on a per-account basis. To test for faulty permission settings, attempt the same actions and activities with Administrator privileges (try Hands-on Project 15-5). Double-check a user's group memberships to verify that Deny access settings are not causing the problem. This means examining the access control lists (ACLs) of the objects and the share, if applicable (see Figure 15-11).

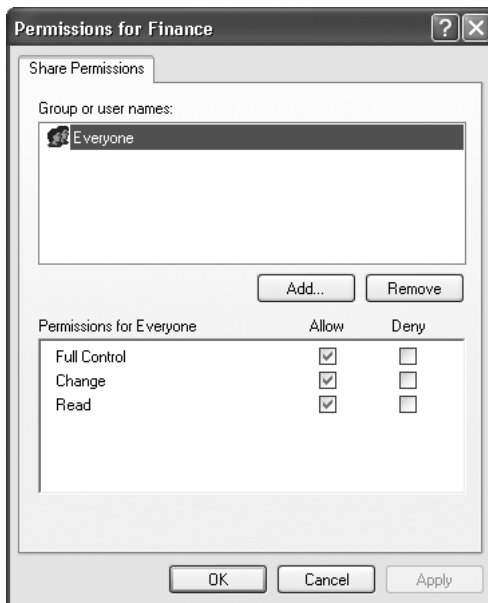


Figure 15-11 Setting share permissions



It is important to remember that any changes to the access permissions for individual users or groups will not affect those users until the next time they log on. The access token used by the security system is created each time a user logs on, but is not altered as long as they stay logged on. This means that any time you need to make sweeping changes to file system or share permissions, it's a good idea to do so when few users are logged on, and to disconnect those users to force them to log back in under the new permissions regime!

Master Boot Record Problems

As you learned in Chapter 13, the Master Boot Record (MBR) is the area of a hard drive that contains the data structure for initiating the boot process. However, if the

MBR fails, the Emergency Repair Disk (ERD) cannot be used to repair it. Instead, you must use a recovery tool of some kind, for which there are several approaches:

- Boot from the Windows XP Professional boot floppies (all 6 of them), use F8 to select the alternate boot menu, then select the Recovery Console from that menu.
- Reconfigure your system BIOS to boot from your CD player, then boot from the Windows XP Professional installation CD. Here you can select Repair damaged installation as an option, and also access the Recovery Console.
- If neither of the preceding methods works, you'll need to use a DOS 6.0 (or later) bootable floppy to boot into DOS.

If you can access the Recovery Console, use the `FIXMBR` command to repair the MBR. If you are forced to boot into DOS, then use the `FDISK/MBR` command. At that point, execute the command `fdisk/mbr`, which will re-create the drive's MBR and restore the system correctly. If you don't have access to the `FDISK`, you'll have to perform a complete install/upgrade of Windows XP Professional to allow the setup routine to re-create the MBR.

Using the Dr. Watson Debugger

Windows XP Professional has an application error debugger called **Dr. Watson**. This diagnostic tool detects application failures and logs diagnostic details. Data captured by Dr. Watson are stored in the `Drwtsn32.log` file. Dr. Watson can also be configured to save a memory dump of the application's address space for further investigation. However, the information extracted and stored by Dr. Watson is really only useful to a technical professional well versed in the debugger's cryptic logging syntax.

Windows XP Professional automatically launches Dr. Watson when an application error occurs. To configure Dr. Watson, however, you'll need to launch it from the Start, Run command with `drwtsn32.exe`. Figure 15-12 shows the configuration dialog box for Dr. Watson. As you can see, this dialog box lists the configuration items for the following:

- Log File Path—Where the Dr. Watson log file is stored
- Crash Dump—Provides the dump location for an application's virtual machine's address space
- Number of Instructions
- Number of Errors To Save
- Options of what to include in log file and how to notify the user of an application fault
- A list of previous Application Errors, with access to the log file details

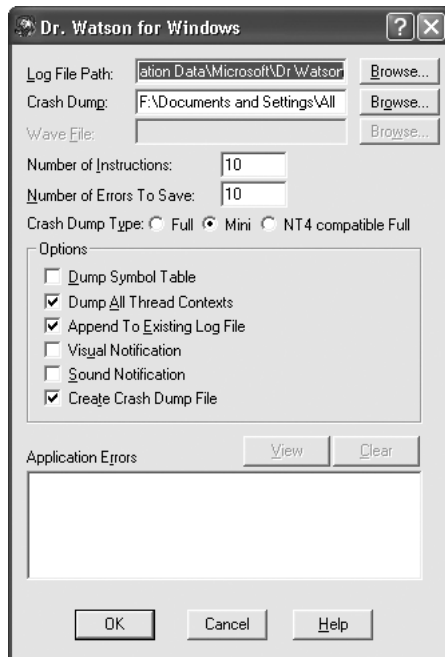


Figure 15-12 Dr. Watson configuration dialog box

APPLYING SERVICE PACKS AND HOT FIXES

A **service pack** is a collection of code replacements, patches, error corrections, new applications, version improvements, or service-specific configuration settings from Microsoft that corrects, replaces, or hides the deficiencies of the original product, preceding service packs, or hot fixes. A **hot fix** is similar to a service pack, except that it addresses only a single problem, or a small number of problems, and may not be fully tested (and is not normally supported, unless you have a special service agreement with Microsoft).



You should apply a hot fix only if you are experiencing the problem it was created to solve; otherwise, the hot fix may cause other problems. Most production environments avoid using hot fixes whenever possible in favor of waiting until the next service pack rolls them up in a form that is fully tested and better supported. The exception to this rule is security-related hot fixes, in which case the affected machine might remain vulnerable to a documented threat or attack if the hotfix is not applied.

Service packs are cumulative. For example, Service Pack 3 (SP3) for Windows 2000 Professional contains SP2 plus all post-SP2 hot fixes. Thus, the latest service pack is all you need to install. For instructions on installing and removing service packs, try Hands-on Projects 15-6 and 15-7.



At this writing, Microsoft has not yet announced a release date for the first service pack for Windows XP Professional. Thus, this section of the chapter is based on pre-release documentation and our experience with Windows 2000 service packs. Take the time to review the documentation included with a real Windows XP Professional service pack once it is available.



It is also common practice among production networks to wait one to three months after the release of a new service pack before deploying it. This gives the installed community time to test and provide feedback about the patch. The track record of service packs from Microsoft is not perfect, so it's better to wait for verification of a service pack's reliability than to deploy it immediately after its release and live to regret it.

Important points to remember about patches such as service packs and hot fixes include:

- Always make a backup of your system before applying any type of patch; this will give you a way to restore your system if the fix damages the OS.
- Be sure you've retrieved a patch for the correct CPU type and language version.
- Always read the *readme* and *Knowledge Base Q* documents for each patch before installing it.
- Update your Emergency Repair Disk (ERD) both before and after applying a patch.
- Make a complete backup of the Registry using the Registry Editor or the REGBACK utility on the *Microsoft Windows XP Professional Resource Kit*.
- Export the disk configuration data from Disk Administrator.
- Because service packs rewrite many system-level files, you must disconnect all current users, exit all applications, and temporarily stop all unneeded services before installing any service pack or patch.

To locate Microsoft Knowledge Base documents, visit or use one of these resources:

- Web site: <http://support.microsoft.com/>
- TechNet CD
- Microsoft Network
- Resource Kit documentation (online help file)

Service packs and hot fixes can be retrieved from:

- Microsoft FTP site: <ftp://ftp.microsoft.com/bussys/winnt/winnt-public/fixes/usa/>
- The Download section of the Microsoft Windows Web site:
<http://www.microsoft.com/downloads/>

To determine what service packs have been applied to your system, you can use one of the following techniques:

- Enter *WINVER* from a command prompt to view an About Windows dialog box.
- Select Help, About Windows from the menu bar of any native tool such as My Computer or Explorer.
- Use the Registry Editor to view the *CSDVersion* value in the *HKEY_LOCAL_MACHINE\SOFTWARE\Microsoft\WindowsNT\CurrentVersion*.

MICROSOFT TROUBLESHOOTING REFERENCES

Several Microsoft resources can aid you in troubleshooting and working with Windows XP Professional:

- *The Microsoft Windows Web site*—<http://www.microsoft.com/windowsxp/>
- *The Knowledge Base*—The predecessor to and a resource for the TechNet CD is the online Knowledge Base. This resource can be accessed by several means, as detailed earlier in this chapter.
- *TechNet*—The best periodic publication from Microsoft is TechNet. This multi-CD collection is an invaluable resource for white papers, FAQs, troubleshooting documents, book excerpts, articles, and other written materials, plus utilities, patches, fixes, upgrades, drivers, and demonstration software. At only \$300 per year (as of this writing), it is well worth the cost. It is also available online in a limited form at <http://technet.microsoft.com/>.
- *Resource Kits*—The Resource Kits are useful information sources. These are available in electronic form through the CD-based version of TechNet in their entirety, and through the online version of TechNet in portions. Resource Kits document material above and beyond what's contained in the manuals and on-line help files, and often include additional software utilities to enhance product use. These Resource Kit Utilities (as they're called) often provide valuable administrative functionality not available from built-in consoles and utilities. They are also available in book form through Microsoft Press.

CHAPTER SUMMARY

- No matter what problems or errors are discovered on your computer system, there are several common-sense principles of troubleshooting you should always follow. These include performing one task at a time, remaining calm, isolating the problem, and performing the simplest fixes first.

- Information is the most valuable troubleshooting tool. Making sure you have the best information includes maintaining a Computer Information File and a detailed log or history of troubleshooting activities.
- The Windows XP Professional tools most often used for troubleshooting are Event Viewer and the Computer Management tool.
- There are five common installation problems: media errors, domain controller communication difficulties, stop message errors or halt on blue screen, hardware problems, and dependency failures.
- Printer problems are most often associated with physical configuration or spooling problems.
- RAS and network problems may be caused by several types of problems, but the most common type arises from misconfiguration.
- Service packs and hot fixes are used to repair portions of Windows XP Professional after its release.
- Microsoft has provided several avenues to access information about the operation and management of Windows 2000, including a substantial collection of troubleshooting documentation. Much of this is available at no charge from the Microsoft Web site.

KEY TERMS

Application log — Records application events, alerts, and system messages.

Computer Information File (CIF) — A detailed collection of all information related to the hardware and software products that comprise your computer (and even your entire intranet).

Dr. Watson — An application error debugger. This diagnostic tool detects application failures and logs diagnostic details.

Event Viewer — The utility used to view the three logs automatically created by Windows 2000: the System log, Application log, and Security log.

hot fix — Similar to a service pack, except that a hot fix addresses only one problem, or a small number of problems, and may not be fully tested.

master boot record (MBR) — The area of a hard drive that contains the data structure that initiates the boot process.

Security log — Records security-related events.

service pack — A collection of code replacements, patches, error corrections, new applications, version improvements, or service-specific configuration settings from Microsoft that corrects, replaces, or hides the deficiencies of the original product, preceding service packs, or hot fixes.

System log — Records information and alerts about Windows XP Professional's internal processes.

REVIEW QUESTIONS

1. When approaching a computer problem, which of the following should you keep in mind? (Choose all that apply.)
 - a. How the problem was last solved.
 - b. What changes were recently made to the system.
 - c. Information about the configuration state of the system.
 - d. Ability to repeat the failure.
2. If a media error occurs during installation, which of the following steps should you take to eliminate the problem? (Choose all that apply.)
 - a. Attempt to re-copy or re-access the file that caused the failure.
 - b. Switch media sources or types.
 - c. Open the Control Panel and reinstall the appropriate drivers.
 - d. Restart the installation from the beginning.
3. Which of the following Windows repair tools can be used to gain information about drivers or services that failed to load?
 - a. Event Viewer
 - b. Registry
 - c. System applet
 - d. Dr. Watson
4. In addition to the Event Viewer and System Information, which of the following are useful tools in general troubleshooting? (Choose all that apply.)
 - a. Advanced Options Boot Menu
 - b. Registry Editors
 - c. Backup software
 - d. Time/Date applet
5. Your best tool in troubleshooting is:
 - a. A protocol analyzer
 - b. Information
 - c. Administrative access
 - d. Redundant devices
6. Which of the following are possible troubleshooting techniques for eliminating printer problems? (Choose all that apply.)
 - a. Check the physical aspects of the printer: cable, power, paper, toner, and so on.
 - b. Check the print queue for stalled jobs.
 - c. Attempt to print from a different application or a different client.
 - d. Stop and restart the spooler using the Services tool.
 - e. Disconnect from the network.

7. Which of the following are common RAS problems?
 - a. Telco service failures
 - b. Misconfiguration
 - c. User error
 - d. Communication device failure
8. A user's ability to access a resource is controlled by access permissions. If you suspect a problem with a user's permission settings, what actions can you take? (Choose all that apply.)
 - a. Attempt the same actions and activities with the Administrator account.
 - b. Delete the user's account and create a new one from scratch.
 - c. Double-check group memberships to verify that Deny access settings are not causing the problem.
 - d. Grant the user Full Access to the object directly.
9. What application automatically loads to handle application failures?
 - a. Event Viewer
 - b. System applet
 - c. Computer Management
 - d. Dr. Watson
10. If you are going to create a CIF, which of the following is the most important?
 - a. Include the vendor's mailing address
 - b. Keep everything in electronic form
 - c. Update the contents often
 - d. Use non-removable labels on all components
11. Which of the following are important actions to perform before installing a service pack or a hot fix? (Choose all that apply.)
 - a. Make a backup of your system.
 - b. Read the readme and Knowledge Base Q documents.
 - c. Make a complete backup of the Registry.
 - d. Enable virus protection.
12. What are some common-sense approaches to troubleshooting?
 - a. Understand TCP/IP routing table configuration
 - b. Know your system
 - c. Undo the last alteration to the system
 - d. Replace all server hardware when one device fails
 - e. Let the fault guide you

13. You can often resolve problems or avoid them altogether if you take the time to write out a history or log of problems and both failed and successful solution attempts. True or False?
14. When installing a new Windows 2000 domain controller into an existing domain, you can experience communication problems with the current domain controller. After you've verified that the current domain controller is online and properly connected to the network, what other items should be considered as possible points of failure? (Choose all that apply.)
 - a. shorten the computer name from 12 to 10 characters.
 - b. subnet mask
 - c. password
 - d. domain name
15. Blue screen or Stop errors are often caused by a system when one or more devices are not found on the HCL. True or False?
16. If the driver for your network interface card fails, which other components of your system are most likely to fail due to dependency issues? (Choose all that apply.)
 - a. network protocol
 - b. Client Services for NetWare
 - c. video driver
 - d. WinLogon
17. Errors involving internal processes such as hardware and operating system errors, warnings, and general information messages are recorded in the Application log of the Event Viewer. True or False?
18. Which of the following are valid methods for resolving hardware problems? (Choose all that apply.)
 - a. Restart the installation from scratch without any other modifications
 - b. Press and hold the Ctrl key during the installation
 - c. Remove or replace the non-HCL hardware
 - d. Recopy the distribution files
19. An event detail viewed from the Event Viewer's logs provides specific information on the time, location, user, service, and resolution for all encountered errors. True or False?
20. The Computer Management tool offers links to several important administrative and management utilities including: (Choose all that apply.)
 - a. Control Panel
 - b. Event Viewer
 - c. Performance Monitor
 - d. Local Security Policy
 - e. Local Users and Groups

21. The Storage section of the Computer Management tool offers utilities to perform what types of operations? (Choose all that apply).
 - a. Defragmentation
 - b. Partitioning
 - c. Managing Removable Storage
 - d. Compressing Floppies
22. When a printer fails to print your documents, which of the following is a useful first step in troubleshooting?
 - a. Replacing the printer
 - b. Restarting the spooler
 - c. Re-installing the operating system
 - d. Delete and re-create the shared printer
23. Both printers and RAS connections can suffer from the most common problem: physical connection interruptions. True or False?
24. When a user complains about being unable to access a resource that other users of similar job descriptions are able to access, what should you consider when attempting to troubleshoot this issue? (Choose all that apply.)
 - a. Group memberships
 - b. ACL on the object
 - c. Domain membership
 - d. Speed of network connection
25. When you alter the group memberships of a user, how do you ensure that the changes take effect?
 - a. Reboot the server
 - b. Enable auditing on file objects
 - c. Restart the messaging and alert services
 - d. Log the user account out, then allow them to log back in

HANDS-ON PROJECTS



Project 15-1

To use the Event Viewer:

1. Open the Event Viewer from the Start menu (**Start** | **Control Panel** | double-click **Administrative Tools** | double-click **Computer Management** | **Event Viewer** to display the list of available logs).

2. Select the **System** log from the list of available logs in the left pane.
3. Notice the various types of events that appear in the right pane.
4. Select an event in the right pane.
5. Select **Action | Properties** (or more simply, double-click the event entry).
6. Review the information presented in the Event Properties dialog box. Try to determine on your own what types of errors, warnings, or information is presented in the detail and why the detail was created.
7. Click the up and/or down arrows to view other event details.
8. Click **OK** to close the event detail.
9. Select **File | Exit** to close Event Viewer.



Project 15-2

To extract information for a CIF:



This hands-on project suggests a method to obtain some information about your system for a CIF; it does not constitute a complete or exhaustive collection of data. This activity is only one part of the task of creating a CIF.

1. Click **Start | All Programs | Accessories | System Tools | System Information**.

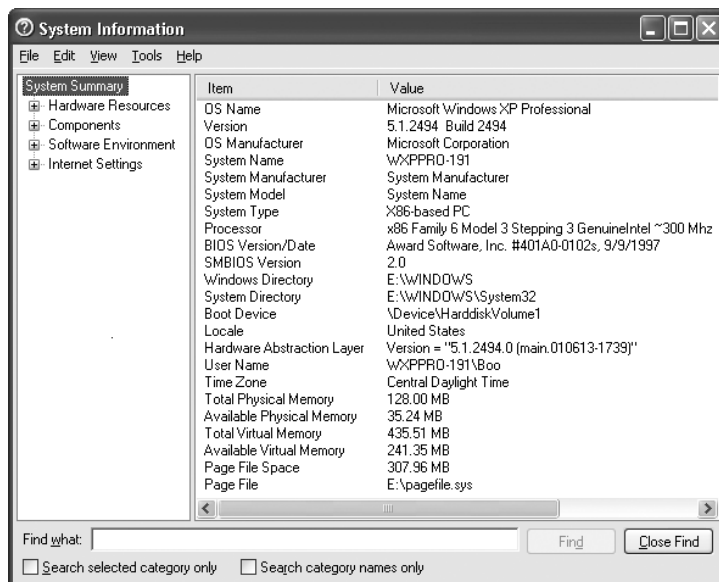


Figure 15-13 The System Information tool

2. Expand the four dependents of the **System Summary** entry in the left hand pane—that is, **Hardware Resources**, **Components**, **Software Environment**, and **Internet Settings**—by clicking the boxed plus sign to the left of each unexpanded node.
3. Take the time to expand and select every item in the resulting node hierarchy. As you view each page of data, consider the value of this data for future troubleshooting and decide whether to print or save the information.
4. To print a page, click the **Print** entry in the File menu from the menu bar.
5. To save a page, click on the **Save** entry in the File menu from the menu bar (this produces text-only .NFO or information files for later examination and use).
6. When you have finished examining your System Information, close the utility.



Project 15-3

To explore the Computer Management utility:

1. Open the **Control Panel (Start | Control Panel)**.
2. Double-click **Administrative Tools**.
3. Double-click **Computer Management**.
4. Notice that the left hand pane hosts three divisions: System Tools, Storage, and Services and Applications.
5. Expand the **System Tools** entry by clicking the boxed plus sign located to the left of the node name.
6. Explore the contents of the Event Viewer, Performance Logs and Alerts, Shared Folders, Device Manager, and Local Users and Groups sections by expanding them one at a time. To view the contents of any item, select it in the left pane so its contents will be displayed in the right pane.
7. Once you've viewed the contents of the System Tools section, view the contents of the Storage section. This section includes Disk Management, Disk Defragmenter, and Removable Storage.
8. Once you've viewed the contents of the Storage section, view the contents of the Services and Applications section. The items in this section vary based on installed applications and services but can include WMI Control, Services, and Indexing Service.
9. Once you've viewed the contents of the Services and Applications section, close the Computer Management utility.



Project 15-4

To troubleshoot a printer problem:



This hands-on project is not an exhaustive process for printer troubleshooting; it includes some of the actions that may be required to resolve a printer problem.

1. First, check that the printer is online, has power, has paper, and has toner. Check the printer's own error reporting center (often a light or an LCD) for any possible hardware errors.
2. Open the Printers applet (**Start | Printers and Faxes**).
3. Double-click the installed printer that you suspect is having a problem to display the printer queue window.
4. If any documents appear in the printer queue window, select the topmost document, then select **Document | Restart**.
5. If the printer still fails to function, go to the Control Panel (**Start | Control Panel**).
6. Double-click the **Administrative Tools** icon.
7. Double-click **Computer Management**.
8. Navigate down in the hierarchy of the left pane to locate and select the Services tool (**Computer Management, Services and Applications, Services**).
9. Locate and select the **Print Spooler** service in the Extended tab (see Figure 15-14).

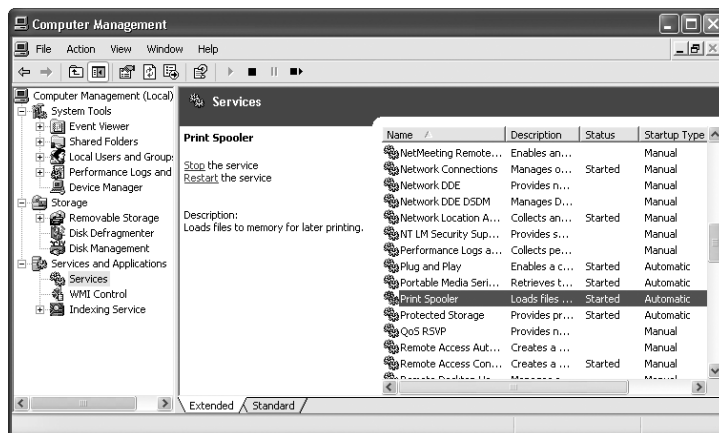


Figure 15-14 The Computer Management tool; Services and Applications

10. Select **Action | Stop**.
11. Select **Action | Start**.

12. Close the Computer Management utility.
13. Close the Control Panel.
14. If the printer still fails to function, return to the Printer queue window that was left open.
15. Select the topmost document in the printer queue.
16. Click the **Document** menu, then select the **Cancel** command to remove the print job from the queue.
17. If this was the only print job in the queue, print another document. If this was not the only print job in the queue, wait to see if the remaining print jobs print.



Consult Chapter 9 for more details on managing printers.



Project 15-5

To troubleshoot permission problems:



This hands-on project is not an exhaustive process for permission troubleshooting; it includes some of the actions that may be required to resolve permission problems.

1. If a user cannot access a resource to which they should have access, first reboot their system (**Start | Shutdown**). Select **Restart** from the pull-down menu, then click **OK**.
2. After rebooting, log back in as the user. Test to see if you can access the resource.
3. If the resource is still not accessible, log out and log back in as an administrator: Press **Ctrl+Alt+Delete** at the logon prompt, then provide the user account name for the administrator and the associated password. Click **OK**.
4. Once logged in as the administrator, attempt to access the resource. If the resource can be accessed, the problem is with the assigned permissions for the user account. Most likely the user account is not a member of the proper group or is a member of a group that has Deny access set for that resource.
5. If the resource cannot be accessed by the administrator, the problem may lie with the system itself. This could include network communications, domain membership, or corrupted system drivers and files. You will need to troubleshoot these other possible causes of the problem.
6. If you discover that group membership is the problem, make the appropriate group membership changes, then force the user to log out and log back in (changes do not take effect until the next logon).



Project 15-6

To apply a service pack:

1. Move or copy the service pack (SP) file into an empty directory as follows. From within Windows Explorer, create a new directory on a volume with at least 100 MB of free space (more may be required depending on the size of the service pack). Move or copy the SP into the new empty directory.
2. Close all applications, especially debugging tools, virus scanners, and any other non-Microsoft or third-party tools.
3. Locate and execute **Update.exe** with the **Start | Run** command.
4. Follow any prompts that appear. If you want the ability to uninstall the service pack, be sure to select the option to store uninstall information. It's generally a good idea to select this option.
5. When instructed, reboot your system.
6. After rebooting, you can delete the service pack files and the temporary directory from your hard drive (refer to step 1).



Project 15-7

To uninstall a service pack:



You must have selected the “save uninstall information” option during the initial application of the service pack in order to uninstall it.

1. Extract the original SP archive into an empty directory. If you retained the SP archive and temporary directory from the installation procedure, you do not need to repeat this activity.
2. Locate and execute **Update.exe**.
3. Click the **Uninstall a previously installed service pack** button.
4. Follow the prompts.
5. Reboot.



Project 15-8

To verify that the Workstation and Server services are started after bootup:

1. Open the **Control Panel** (**Start | Control Panel**).
2. Double-click **Administrative Tools**.
3. Double-click **Computer Management**.
4. Expand the **Services and Applications** section by clicking on the boxed plus sign next to the node name if it is not already expanded.

5. Select the **Services** object.
6. Scroll down in the right pane to locate the Workstation service.
7. Notice the item in the Status column. If it says “Started,” you can skip to step 9.
8. If the Status column is blank for the Workstation service, it failed to launch at startup. You can attempt to launch the service by selecting it, clicking the Action menu, then clicking **Start**.
9. Scroll down in the right pane to locate the Server service.
10. Notice the item in the Status column. If it says “Started,” you can skip to step 12.
11. If the Status column is blank for the Server service, it failed to launch at startup. You can attempt to launch the service by selecting it, clicking the Action menu, then clicking **Start**.
12. Close the Computer Management console by clicking on the **X** button on the title bar.

CASE PROJECTS



1. After installing a new drive controller and a video card, along with their associated drivers, Windows XP Professional refuses to boot, and booting with the Last Known Good Configuration (LKGC) option does not result in an operational system.

Required Result:

Return the system to a bootable and operational state.

Optional Desired Results:

Retain the Security ID.

Retain most, if not all, of the system’s configuration.

Proposed solution:

Perform a complete reinstallation of Windows 2000.

- a. The proposed solution produces the desired result and produces both of the optional desired results.
- b. The proposed solution produces the desired result, but only one of the optional desired results.
- c. The proposed solution produces the desired result, but neither of the optional desired results.
- d. The proposed solution does not produce the desired result.

2. After installing a new drive controller and a video card, along with their associated drivers, Windows XP Professional refuses to boot, and the LKGC does not result in an operational system.

Required Result:

Return the system to a bootable and operational state.

Optional Desired Results:

Retain the Security ID.

Retain most, if not all, of the system's configuration.

Proposed solution:

Perform an upgrade reinstallation of Windows 2000.

- a. The proposed solution produces the desired result and produces both of the optional desired results.
 - b. The proposed solution produces the desired result, but only one of the optional desired results.
 - c. The proposed solution produces the desired result, but neither of the optional desired results.
 - d. The proposed solution does not produce the desired result.
3. Describe the common problems associated with installing Windows XP Professional and the appropriate steps to either avoid these problems or resolve them once encountered.